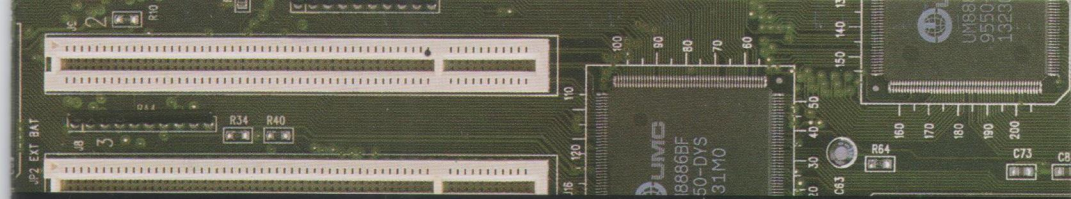
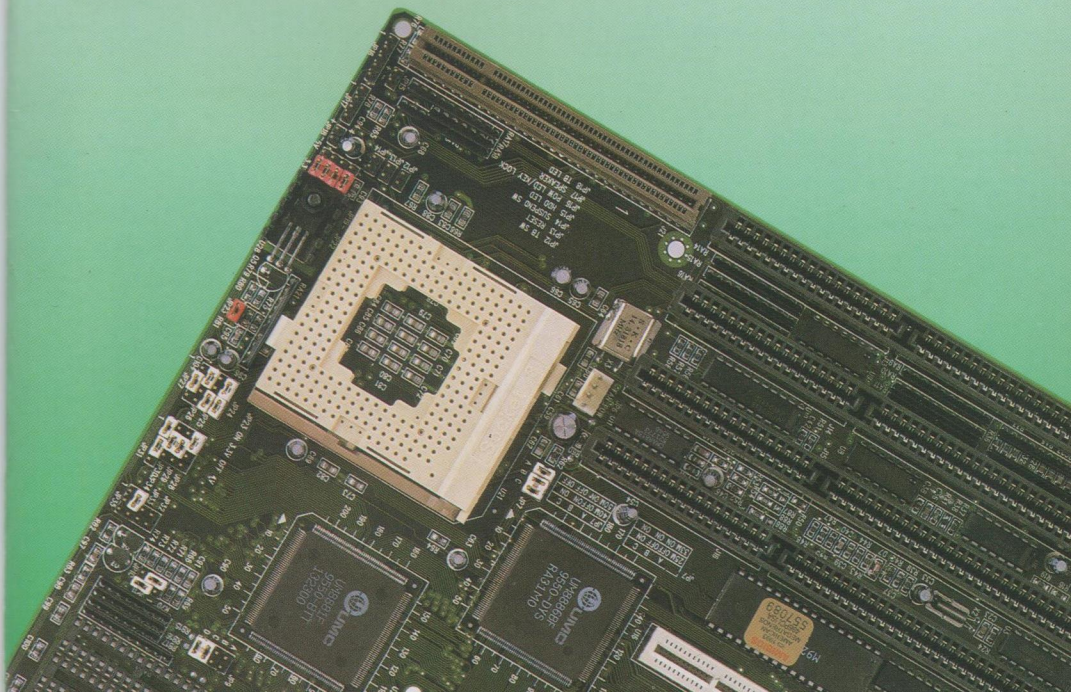


User's manual

486/5X86 Mainboard
VESA, ISA, PCI Bus

With On Board PCI IDE and Super Multi-I/O



The information presented in this publication has been carefully checked for reliability; however, no responsibility is assumed for inaccuracies. Specifications are subject to change without notice.

Trademarks

IBM, PC/AT, and PC/XT are trademarks of International Business Machines Corporation.

Intel is a trademark of Intel Corporation.

AMD is a trademark of Advanced Micro Devices Inc.

Cyrix is a trademark of Cyrix Corporation.

UMC is a trademark of United Microelectronics Corporation.

AMI is a registered trademark of American Megatrends Inc.

TI is a trademark of Texas Instruments Corporation.

SGS is a trademark of SGS-THOMSON MICROELECTRONICS.

Quick Reference Table

This table helps you quickly find information on specific jumpers and connectors.

Jumper/ Connector	Setting/Description	Page
J1	Keyboard Connectors	5
J7	Power Supply Connector	6
JP1	Monitor power control Connector	6
JP12	Turbo Switch Jumper	6
JP13	Reset Switch Connector	7
JP14	Suspend Switch Connector	7
JP16	Power LED / Keylock Connector	7
JP17	Speaker Connector	8
JP18	Turbo LED Connector	8
JP15	Hard Disk LED Connector	8
JP5	FLASH ROM VPP program power Jumper	9
JP2	CMOS RAM Discharge Jumper/ External battery Connector	10
JP7 A~C	CPU Speed Jumpers	13
JP19~JP22, JP23	CPU Power Jumpers	15

Contents

Chapter 1: Introduction 1
Key Features 1
Block Diagram 3
Mainboard Component Locations 4
Chapter 2: Hardware Configuration 5
Connectors 5
J1 – Keyboard Connector 5
J7 – Power Supply Connectors 6
JP1 – Monitor Power Control Connector 6
JP12 – Turbo Switch Connector 6
JP13 – Reset Switch Connector 7
JP14 – Suspend Switch Connector 7
JP16 – Keylock & Power LED Connector 7
JP17 – Speaker Connectors 8
JP18 – Turbo LED Connector 8
JP15 – Hard Disk LED Connector 8
Jumper Switch Settings 9
JP5 – Flash EPROM BIOS Jumper 9
JP2 – CMOS RAM Discharge Jumper/ External Battery Connector 10
CPU Installation 10
CPU Type Jumpers 11
JP7 A~C – CPU Speed Jumpers 13
JP19 ~ JP22, JP23 – CPU Power Jumpers 14
Chapter 3: BIOS Setup 15
Entering WinBIOS Setup 16
WinBIOS Setup Main Menu 17
Setup 17
Utilities 17
Security 17
Default 17
Setup Window 18
Standard Setup 18

Advanced Setup 19
Chipset Setup 21
Power Management Setup 23
Peripheral 24
Security Window 26
Password 26
Anti-Virus 27
Default Window 28
Original 28
Optimal 28

Chapter 1
Introduction

The **80486 VIP** (VESA, ISA, PCI) mainboard is a high-performance mainboard based on the 80486 microprocessor and featuring VESA, PCI and ISA Bus support. The mainboard offers a high degree of flexibility in configuration and is fully IBM PC/AT compatible.

The PCI (Peripheral Component Interconnect) Local Bus is a high performance, 32-bit or 64-bit bus with multiplexed address and data lines. It is intended for use as an interconnect mechanism between highly integrated peripheral controller components, peripheral add-in boards, and process/memory system.

Key Features

The advanced features of the **80486 VIP** mainboard include:

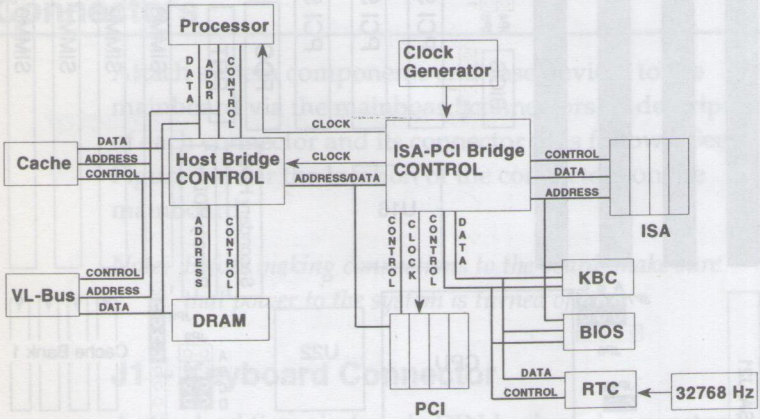
- Supports CPUs running at 25/33/40/50/66/75/80/100/120/133 MHz including:
  - — **Intel** P24D
  - — **Intel** P24T
  - — **Intel** 80486DX4 (P24C)
  - — **Intel** 80486DX / DX2-SL
  - — **Intel** 80486DX2 / DX /SX
  - — **Cyrix/IBM/TI/SGS** DX / DX2 / DX4
  - — **AMD** DX2 / DX4
  - — Cyrix 5x86
  - — AMD Enhanced DX2/DX4 /X5

(Key features continued)

- PCI / Host bridge compliant to PCI specification V2.0
- Supports write back mode CPU internal (Level 1) cache
- Level 2 write back policy for high performance
- Flexible cache RAM size 64/128/256/512/1024 KB in two banks or one bank with 16 bytes line size
- DRAM auto-detection / banking
- Supports eight banks of DRAM including four 72-pin SIMM sockets with memory size up to 256 MB using combinations of 256K, 1M, 2M, 4M, 8M, 16M, 32M, 64M SIMM modules
- Provides green PC power management
- Supports four power management modes for SMM (System Management Mode) CPUs: **On** mode, **Standby** mode, **Inactive** mode, **Off** mode.
- Three PCI connectors and four 16 bit I/O slots including one 32-bit VL-Bus master slots
- On-board CR2032 3.0 Volt lithium battery
- Supports 3.3 / 4.0 Volts for low power CPU
- On-board ZIF socket
- Provides flash ROM support
- Monitor power control connector
- Fan power control connector
- Two enhanced IDE interfaces on-board, both support ATA specifications up to mode 4.
- Supports two 16550 compatible enhanced serial ports and one floppy disk interface
- Supports EPP/ECP high performance parallel port.

Block Diagram

The diagram below shows the **VIP** (VESA, ISA, PCI) mainboard system architecture. In this diagram, the processor / cache / memory subsystem is connected to the **PCI** through the Host/PCI Bridge. This bridge provides a low latency path through which the processor may directly access **PCI** devices mapped anywhere in the memory or I/O address spaces. It also provides a high bandwidth path allowing **PCI** masters direct access to main memory.



Mainboard Component Locations

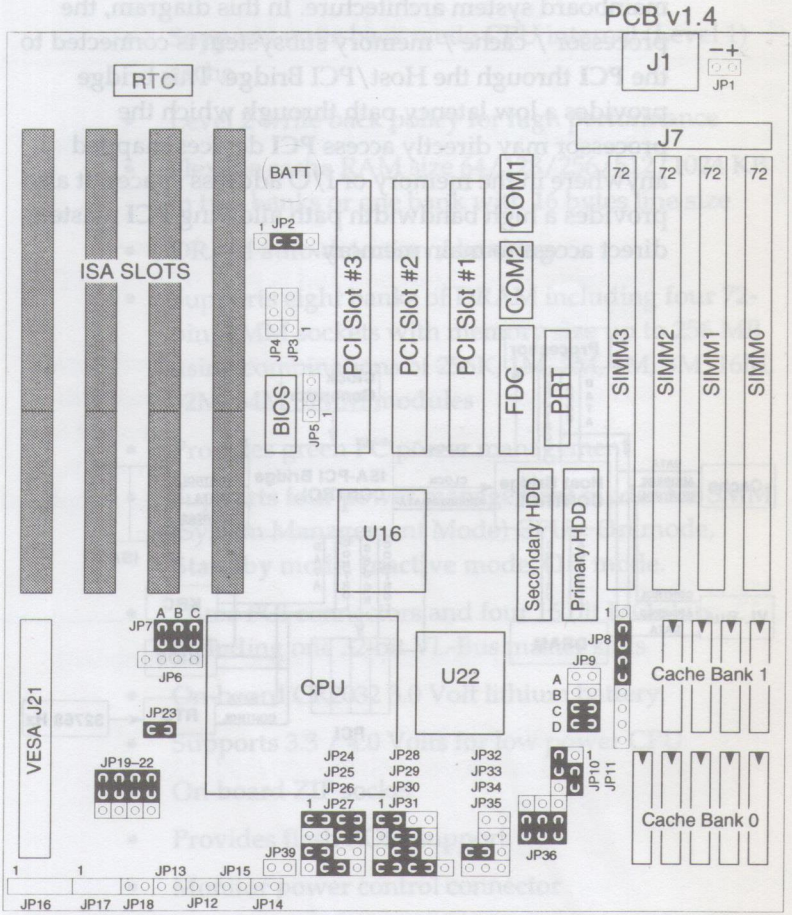


Figure 1–1. Mainboard Component Locations

Chapter 2
Hardware Configuration

Before you install the **80486 VIP** mainboard into the system chassis, you may find it convenient to first configure the mainboard's hardware. This chapter describes how to set jumpers and install memory modules, and where to attach components.

Connectors

Attach system components and case devices to the mainboard via the mainboard connectors. A description of each connector and its connector pins follows. See Figure 1–1 for the location of the connectors on the mainboard.

Note: Before making connections to the board, make sure that power to the system is turned off.

J1 – Keyboard Connector

A standard five-pin female DIN keyboard connector is located at the rear of the board J1.

Pin	Description
1	Keyboard Clock
2	Keyboard Data
3	N.C.
4	Ground
5	+5VDC

J7 – Power Supply Connectors

The power supply connectors are two six-pin male header connectors. Plug the dual connectors from the power directly onto the board connectors.

Pin	Description	Pin	Description
1	Power Good	7	Ground
2	+5V DC	8	Ground
3	+12V DC	9	–5V DC
4	–12V DC	10	+5V DC
5	Ground	11	+5V DC
6	Ground	12	+5V DC

JP1 – Monitor Power Control Connector

Attach the power control signal cable from a Green monitor to this connector.

Pin	Description
1	Anode (+)
2	Cathode (–), Ground

JP12 – Turbo Switch Connector

Attach a turbo switch cable to this connector. A turbo switch lets you control system speed.

Setting	Description
Short	Normal Mode
Open	Turbo Mode

JP13 – Reset Switch Connector

Attach the Reset push button cable to this connector.

Setting	Description
Open	Normal Mode
Short	Reset System

JP14 – Suspend Switch Connector

JP14 connects to a push button that allows you to toggle the system between Suspend mode and Normal mode.

Setting	Description
Default	Normal Mode
Toggle	Force system to enter Suspend mode

JP16 – Keylock & Power LED Connector

JP16 is a keylock connector that enables and disables the keyboard key-in function on the case.

Pin	Description
1	LED Output
2	NC
3	Ground
4	Keylock
5	Ground

JP17 – Speaker Connectors

Attach the system speaker to connector JP17.

Pin	Description
1	Speaker Out
2	Ground
3	Ground
4	5V

JP18 – Turbo LED Connector

Attach a turbo LED for indicating system speed to this connector.

Pin	Description
1	Anode (+)
2	Cathode (–), Ground

JP15 – Hard Disk LED Connector

Attach the hard disk LED to this connector.

Pin	Description
1	Anode (+)
2	Cathode (–), Ground

Jumper Switch Settings

You can configure hardware options by setting jumper switches on the mainboard. See Figure 1-1 for jumper locations.

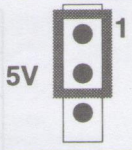
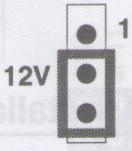
Set a jumper switch as follows:

- *Short* a jumper by placing the plastic jumper cap over two pins of the jumper.
- *Open* the pins of a jumper by removing the jumper cap.

Note: When you open the jumper, attach the plastic jumper cap to one of the pins so you won't lose it.

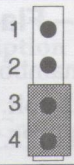
JP5 – Flash EPROM BIOS Jumper

The mainboard uses two types of Flash chip — 5 volt and 12 volt. Set the mainboard for either type with jumper JP5. You can update both types with new BIOS files as they come available.

Description	JP5
5 volt Flash programming	
12 volt Flash programming	

JP2 – CMOS RAM Discharge Jumper/ External Battery Connector

You should set Discharge mode for only a moment when you wish to discharge CMOS, and then make sure this jumper is set for Internal Battery Mode or connect an External Battery to retain your new settings.

Description	JP2
External battery	Connect an external battery to pins 1-4
Internal battery Mode	
Discharge CMOS	

You can also attach an external battery to JP2. The default setting is 2-3, for using the internal battery.

Pin	Description
1	External Battery Positive
2	Internal Battery Positive
3	Connect to CMOS
4	Ground

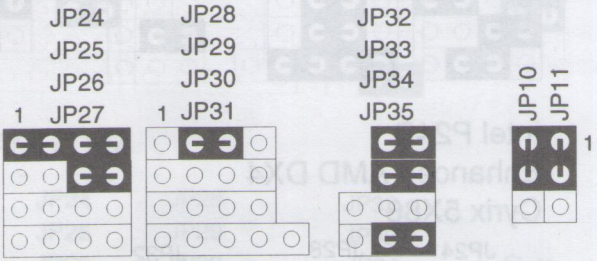
CPU Installation

Set the CPU Type jumpers JP10, JP11, JP24~JP35, the CPU Power Jumpers JP19~JP22, JP23, and the CPU Speed jumpers JP7 as described below. CPU installation is complete.

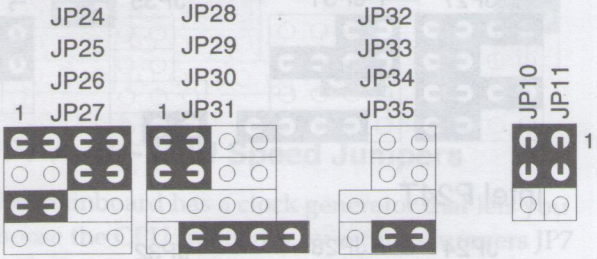
CPU Type Jumpers

Set jumpers JP24~JP35 and JP10~JP11 so that the mainboard recognizes the type of CPU installed. Set CPU type as shown below.

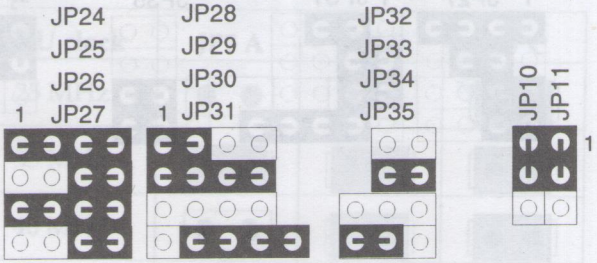
Intel 486DX/DX2



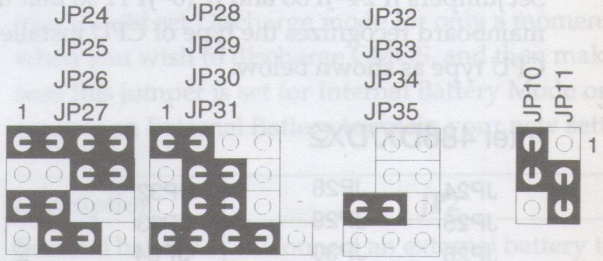
Intel 486DX4 SL



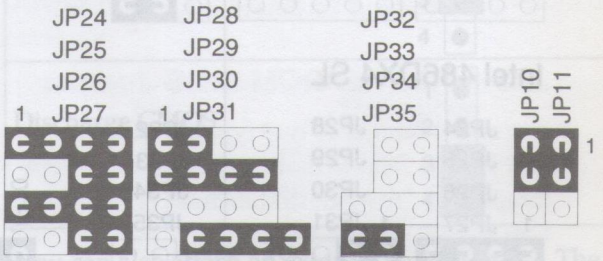
AMD X5-133/Cyrix 5X86-133



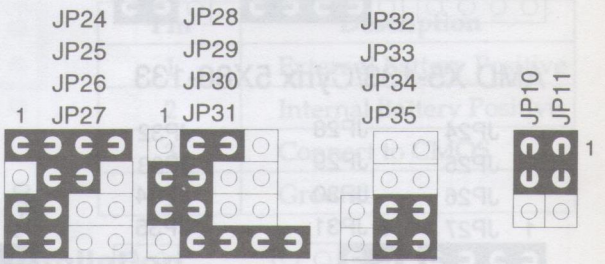
Cyrix/IBM/TI/SGS DX/DX2/DX4



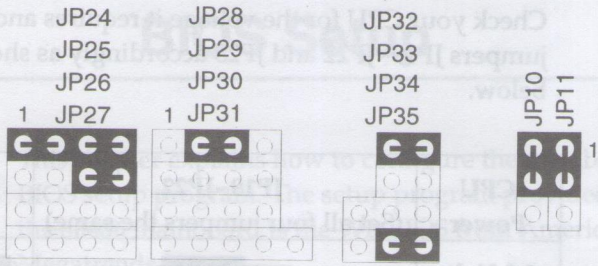
Intel P24D
Enhanced AMD DX4
Cyrix 5X86



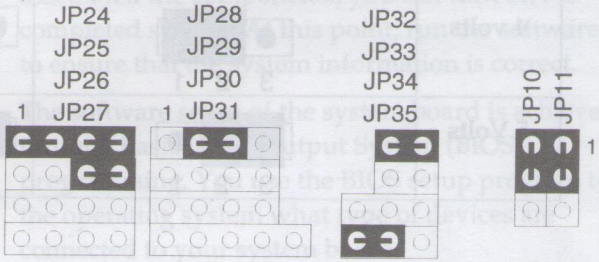
Intel P24T



AMD DX2



AMD DX4



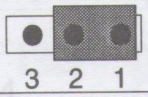
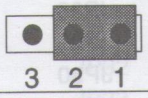
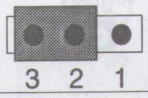
JP7 A~C – CPU Speed Jumpers

The mainboard has a clock generator that lets you choose the CPU frequency by settings jumpers JP7 A~C. You can set the CPU speed for 25 MHz, 33 MHz, 40 MHz or 50 MHz as shown below.

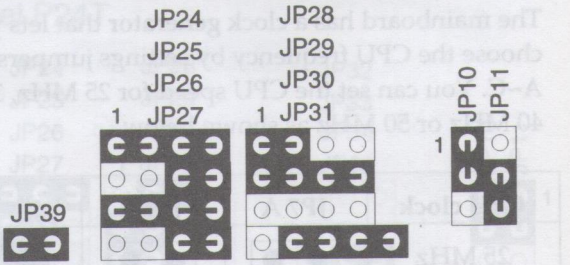
CPU clock	JP7 A	JP7 B	JP7 C
25 MHz			
33 MHz			
40 MHz			
50 MHz			

JP19 ~ JP22, JP23 – CPU Power Jumpers

Check your CPU for the voltage it requires and set jumpers JP19~JP22 and JP23 accordingly as shown below.

CPU Power	JP19~JP22 (Set all four jumpers the same)	JP23
3.3 Volts		
4 volts		
5 Volts		

Cyrix/IBM/SGS DX4/100 (Intel PinOut) CPU Jumper Setting



Chapter 3
BIOS Setup

This chapter explains how to configure the mainboard's BIOS setup program. The setup program provided with the **80486** mainboard is the WinBIOS from American Megatrends Inc.

After you have configured the mainboard, and have assembled the components, you can turn on the completed system. At this point, run the software setup to ensure that the system information is correct.

The software setup of the system board is achieved through Basic Input-Output System (BIOS) programming. You use the BIOS setup program to tell the operating system what type of devices are connected to your system board.

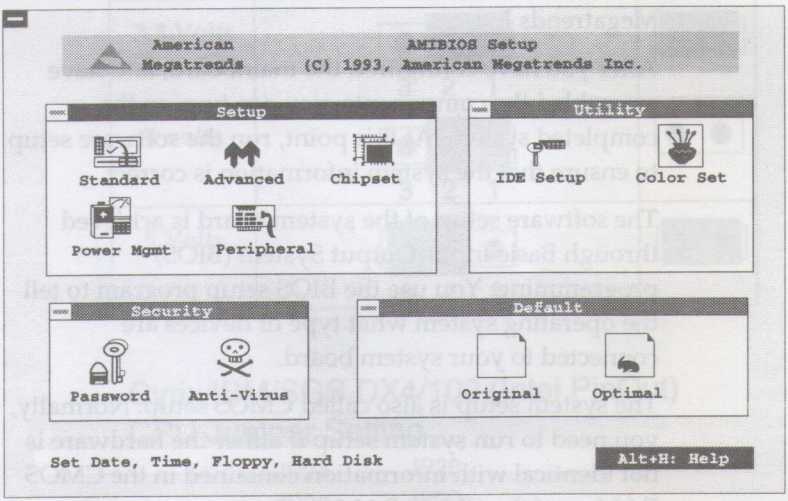
The system setup is also called CMOS setup. Normally, you need to run system setup if either the hardware is not identical with information contained in the CMOS RAM, or if the CMOS RAM has lost power.

Entering WinBIOS Setup

To enter the WinBIOS Setup program:

1. Turn on or reboot the system. A screen appears with a series of diagnostic checks.

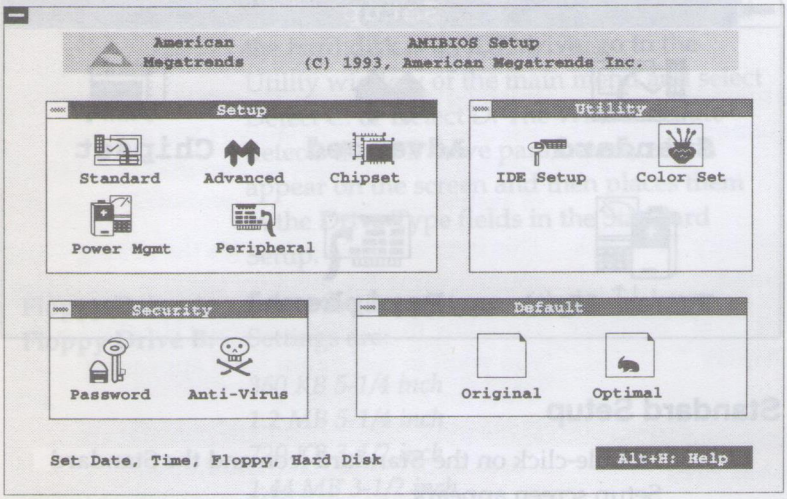
2. When "Hit <DEL> if you want to run SETUP" appears, press the <DEL> key to enter the BIOS setup program. The following screen appears:



3. Use your keyboard or mouse to choose options. Modify system parameters to reflect system options. Press Alt-H for Help.

WinBIOS Setup Main Menu

The WinBIOS Setup main menu has four windows: the Setup window, the Utilities window, the Security window and the Default window.



Setup

The Setup window has five icons that let you set system configuration options such as date, time, hard disk type, floppy type, and many others.

Utilities

This window has four icons that perform system functions.

Security

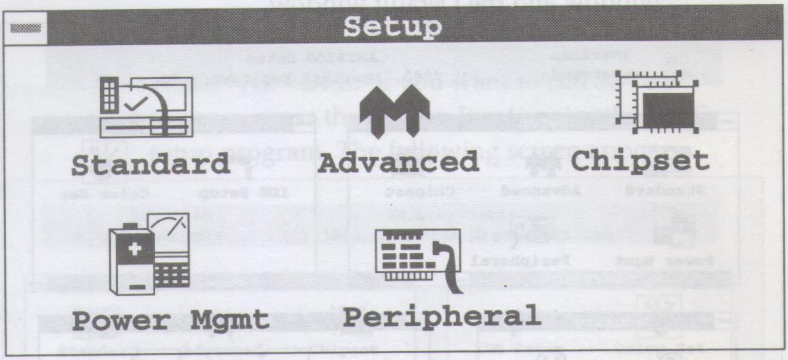
This window's two icons control WinBIOS security features.

Default

This window's two icons let you select default settings for all WinBIOS Setup options. Choose the **Optimal** settings for best performance characteristics.

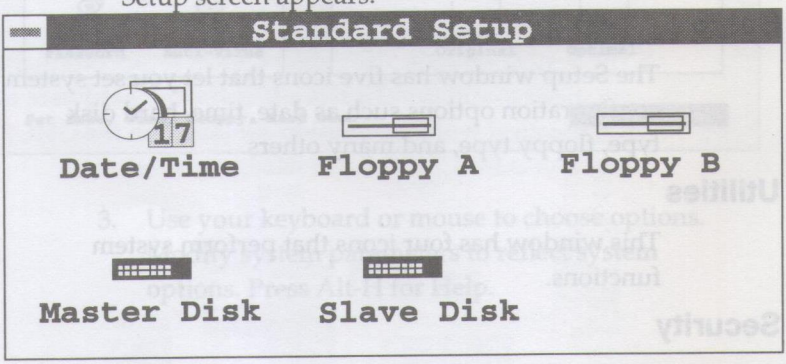
Setup Window

The Setup window has four icons that allow you to set system configuration options.



Standard Setup

Double-click on the **Standard** icon and the Standard Setup screen appears:



Select the icon of the items you wish to change, and modify them using the keyboard or mouse.

Date/Time Current values are displayed. Enter new values using the keyboard.

Master Disk:
Slave Disk: A screen listing all valid disk types appears. Select the correct type and press <Enter>. If the hard disk is an IDE drive, go to the Utility window of the main menu and select Detect C: or Detect D: The WinBIOS auto-detects the IDE drive parameters, which appear on the screen and then places them in the Drive Type fields in the Standard Setup.

Floppy Drive A:
Floppy Drive B: Select the floppy type with the ↑↓ keys. Settings are:

360 KB 5-1/4 inch
1.2 MB 5-1/4 inch
720 KB 3-1/2 inch
1.44 MB 3-1/2 inch
2.88 MB 3-1/2 inch

Advanced Setup

Double-click on the **Advanced** icon and the Advanced Setup screen appears, displaying the items below. Select the items you wish to change, and modify them using the keyboard or mouse.

Typematic Rate (Chars/Sec) To set up the keyboard speed or you may disable this option. Typematic Rate sets the rate at which the characters on the screen repeat when a key is pressed and held down. The settings are 15, 20, 24, and 30 characters per second.

System Keyboard	This item specifies if error messages are displayed when a keyboard is not attached. This option lets you configure workstations that do not have keyboards.
Primary Display	Select this icon to configure the type of monitor attached to the computer.
Above 1M Memory Test	Enabled performs the WinBIOS memory test on all system memory. Disabled only performs the memory test on the first 1MB of system memory.
Memory Test Tick Sound	This item enables or disables the ticking sound during the memory test.
Hit "Del" Message Display	Disabling this option prevents **Hit<DEL> if you want to run Setup** from appearing when the system boots.
Extended ROM RAM Area	This option specifies if hard disk data is stored in the top 1KB of the system programming area, starting at 639K or 0:300 in the system BIOS area low memory.
Wait for "F1" If Any Error	If this option is enabled, WinBIOS waits for the user to press <F1> before continuing.
System Boot Up Num Lock	When ON, this option turns off Num Lock when the system is powered on.
Floppy Drive Seek at Boot	When this option is enabled, WinBIOS performs a seek command on floppy drive A: before booting the system.
System Boot Up CPU Speed	This option sets the sequence of boot drive that WinBIOS attempts to boot from after POST completes.
External Cache	Enables/disables secondary cache memory.
Internal Cache	Enables/disables CPU internal cache memory.

Password Checking This option enables the password check option every time the system boots or the end user runs Setup. If Always is chosen, a user password prompt appears every time the computer is turned on. If Setup is chosen, the password prompt appears when Setup is run.

When you finish with the **Advanced Setup**, press <ESC> or click the exit box to return to the Setup Window.

Chipset Setup

Select the **Chipset** icon and the Chipset Setup screen appears, displaying the items below.

Select the items you wish to change, and modify them using the keyboard or mouse.

Auto Configuration Function This item enables/disables the Auto Configuration function.

Cache Speed Options Sets cache memory speed.

DRAM Read Wait State Sets DRAM Read Wait State.

DRAM Write Wait State Sets DRAM Write Wait State.

PCICLK-to-ISA SYSCLK Divisor Sets BUS ISA clock.

Keyboard Clock Divisor Sets Keyboard controller clock.

L2 Cache Mode Sets external cache write through or write back.

L1 Cache Mode	Sets internal cache write through or write back.
Video BIOS Cacheable	Sets C segment shadow RAM cacheable or not cacheable.
Cyrix LSSER bit	Set Cyrix CPU LSSER bit.
Host-to-PCI Post Write W/S	Sets Host to PCI Burst post write wait state.
Host-to-PCI Burst Write	Enables/Disables Host to PCI Burst write wait state.
LDEV# Sampling Point	Sets LDEV# signal to be sampled on 1st T2 or 2nd T2.
I/O Recovery Time Control	Sets the number of I/O cycle delays for I/I access.
Post Write Buffer	Enables/Disables Post Write Buffer.
Bus Park	Enables/Disables Bus Park Function.
Bus/Resource Lock Option	Sets lock on Resource or bus.

When you finish with the **Chipset Setup**, press <ESC> or click the exit box to return to the Setup Window.

Power Management Setup

Select the **Power Management** icon and the Power Management Setup screen appears, displaying the items below.

Select the items you wish to change, and modify them using the keyboard or mouse.

Power Management	This item enables/disables the Green function.
Doze Mode Timeout	Sets the length of time after which no activity causes the system to go into doze mode. In this mode the CPU clock is /2.
Sleep Mode Timeout	Sets the length of time after which no activity causes the system to go into sleep mode. In this mode the CPU clock is /4.
Suspend Mode Timeout	Sets the length of time after which no activity causes the system to go into suspend mode. In this mode the CPU clock stops.
VA Power Down	Controls whether the VGA shuts off in suspend mode.
HDD Power Down	Sets HDD park upon suspend mode, or sets the time for HDD park.
Monitor PCI Master 0	Sets the system monitor to PCI SLOT 0 activity
Monitor PCI Master 1	Sets the system monitor to PCI SLOT 1 activity
Monitor PCI Master 2	Sets the system monitor to PCI SLOT 2 activity
Monitor LPT Port Activity	Sets the system to monitor LPT port activity.

Monitor COM Port Activity	Sets the system to monitor COM port activity.
Monitor ISA Master & DMA Activity	Sets the system to monitor ISA master or DMA signal.
Monitor IDE Activity	Sets the system to monitor IDE controller.
Monitor FLP Activity	Sets the system to monitor floppy controller.
Monitor VGA Activity	Sets the system to monitor VGA controller.
Monitor I/O Region Activity	Sets the system to monitor I/O port activity
Monitor IRQxx	Sets the system to monitor IRQxx.

When you finish with the **Power Management Setup**, press <ESC> or click the exit box to return to the Setup Window.

Peripheral

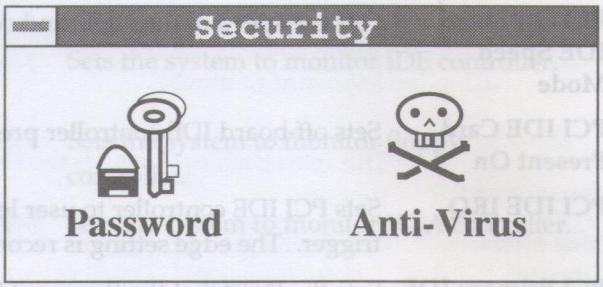
BIOS will arrange IO addresses automatically when the Programming Mode is Auto, otherwise user has to set the IO address manually. If user wants to upgrade to 4S 2P, UMC 8663 and 863 can't be used.

PCI On Board IDE Drive	Enables/Disables On Board IDE controller.
Serial Port 1	Set Serial Port 1 to COM1/3F8H, COM3/3E8H, or Disabled.
Serial Port 2	Set Serial Port 2 to COM2/2F8H, COM4/2E8H, or Disabled.

Parallel Port	Set Parallel Port to LPT1/378H, LPT2/278H, or Disabled.
Parallel Port Mode	Set transfer rate mode to EPP, SPP, or ECP.
PCI On Board IDE Speed Mode	Sets the speed of the HDD and controller.
PCI IDE Card Present On	Sets off-board IDE controller present or not.
PCI IDE IRQ	Sets PCI IDE controller to user level or edge trigger. The edge setting is recommended.
PCI Primary IDE IRQ	Sets the INT# that the Primary HDD uses.
PCI Secondary IDE IRQ	Sets the INT# that the Secondary HDD uses.
IDE Block Mode	This item enables/disables the IDE controller Block mode for HDD access.
IDE 32 Bit Transfers Mode	This item enables/disables the IDE controller 32 bit mode for HDD access.
Primary Master LBA Mode	This item enables/disables Primary Master HDD LBA Mode access.
Primary Slave LBA Mode	This item enables/disables Primary Slave HDD LBA Mode access.
Secondary Ctrl Drives Present	This item selects the number of HDD on secondary controller, or None.
Secondary Master LBA Mode	This item enables/disables Secondary Master HDD LBA Mode access.
Secondary Slave LBA Mode	This item enables/disables Secondary Slave HDD LBA Mode access.

Security Window

The Security window has two icons with security functions.



Password

1. Select this icon and the Password keyboard appears.
2. Enter a 1~6 character password using either a mouse or pen stylus, or typing your keyboard. The password does not appear on the screen when typed.

   If you do not type any characters, and just press the "Enter" key twice, the password is disabled.
3. The BIOS prompts you to re-enter the password to confirm.
4. Make sure "Password Checking" in the Advanced Setup is configured for "Always" or "Setup." See the section above on "Advanced Setup."

Anti-Virus

Double-click this icon and a list box appears, allowing you to enable or disable the Virus Protection feature. When Enabled the BIOS issues a warning when any program or virus sends a Disk Format command or tries to write to the boot sector of a hard disk drive.

Formatting the Hard Disk Drive

You should not enable anti-virus protection when formatting a hard disk drive.

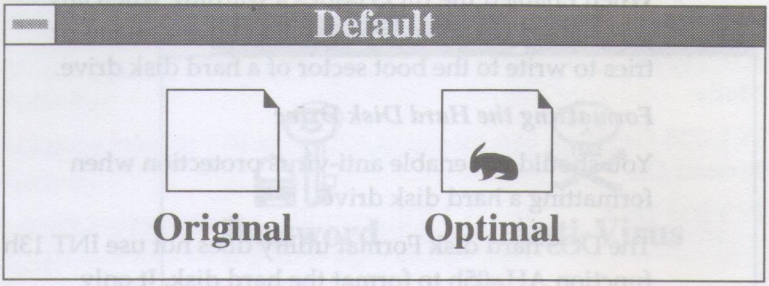
The DOS hard disk Format utility does not use INT 13h function AH=05h to format the hard disk. It only verifies the hard disk using the INT 13h Verify function (AH=04h). The virus warning message is not displayed during DOS hard disk drive formatting.

If the anti-virus feature is enabled, a virus warning message is displayed when you attempt to format the hard disk drive.

If you select *Continue*, formatting proceeds as normal. If you do not want to continue formatting, you may have to press *N* several times (depending on how many retries are performed by the upper-level software). DOS, for example, does at least five retries before the Format utility is actually aborted.

Default Window

The Default window has two icons for different BIOS default settings.



Original

Select this icon to return to the system configuration values present in the WinBIOS Setup when you first began this WinBIOS Setup session.

Optimal

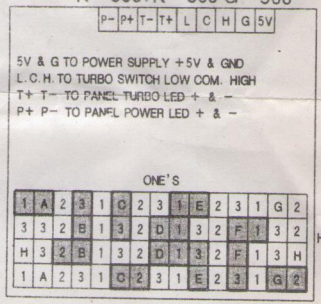
Select this icon for settings that provide the best performance characteristics. If CMOS RAM is corrupted, the Optimal settings are loaded automatically.

R34
R40
R64
C73
C83
UMC
18886BF
50-DYS
31MO

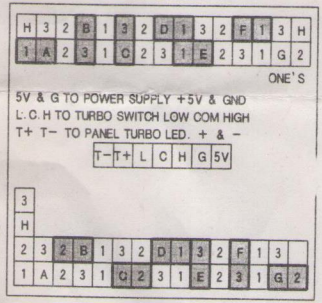
G－568
K－569
K－568
S－305H

DISPLAY & CABLE ASSEMBLY INSTRUCTION

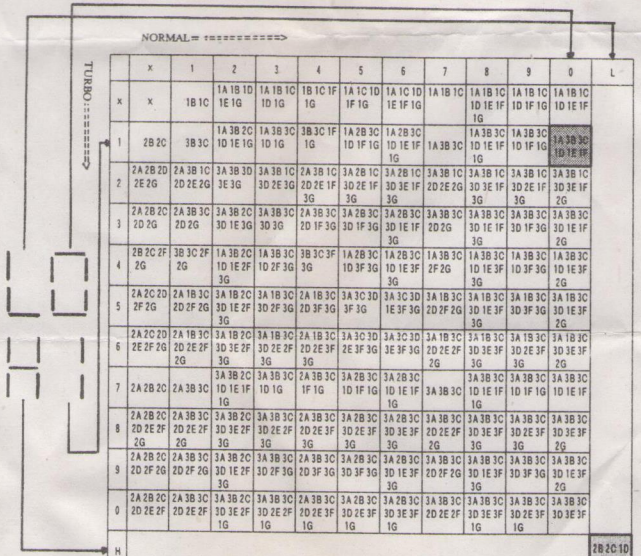
K－568. K－569 G－568



S－305H.



PRESTTING OF NORMAL & TURBO FREQUENCY



	X	1	2	3	4	5	6	7	8	9	0	L
X	X	1B 1C	1A 1B 1D 1E 1G	1A 1B 1C 1D 1G	1B 1C 1F 1G	1A 1C 1D 1F 1G	1A 1C 1D 1E 1F 1G	1A 1B 1C	1A 1B 1C 1D 1E 1F 1G	1A 1B 1C 1D 1F 1G	1A 1B 1C 1D 1E 1F	
1	2B 2C	3B 3C	1A 3B 2C 1D 1E 1G	1A 3B 3C 1D 1G	3B 3C 1F 1G	1A 2B 3C 1D 1F 1G	1A 2B 3C 1D 1E 1F 1G	1A 3B 3C	1A 3B 3C 1D 1E 1F 1G	1A 3B 3C 1D 1F 1G	1A 3B 3C 1D 1E 1F	
2	2A 2B 2D 2E 2G	2A 3B 1C 2D 2E 2G	3A 3B 3D 3E 3G	3A 3B 1C 3D 2E 3G	2A 3B 1C 2D 2E 1F 3G	3A 2B 1C 3D 2E 1F 3G	3A 2B 1C 3D 3E 1F 3G	3A 3B 1C 2D 2E 2G	3A 3B 1C 3D 3E 1F 3G	3A 3B 1C 3D 2E 1F 3G	3A 3B 1C 3D 3E 1F 2G	
3	2A 2B 2C 2D 2G	2A 3B 3C 2D 2G	3A 3B 2C 3D 1E 3G	3A 3B 3C 3D 3G	2A 3B 3C 2D 1F 3G	2A 2B 3C 3D 1F 3G	3A 2B 3C 3D 1E 1F 3G	3A 3B 3C 2D 2G	3A 3B 3C 3D 1E 1F 3G	3A 3B 3C 3D 1F 3G	3A 3B 3C 3D 1E 1F 2G	
4	2B 2C 2F 2G	3B 3C 2F 2G	1A 3B 2C 1D 1E 2F 3G	1A 3B 3C 1D 2F 3G	3B 3C 3F 3G	1A 2B 3C 1D 3F 3G	1A 2B 3C 1D 1E 3F 3G	1A 3B 3C 2F 2G	1A 3B 3C 1D 1E 3F 3G	1A 3B 3C 1D 3F 3G	1A 3B 3C 1D 1E 3F 2G	
5	2A 2C 2D 2F 2G	2A 1B 3C 2D 2F 2G	3A 1B 2C 3D 1E 2F 3G	3A 1B 3C 3D 2F 3G	2A 1B 3C 2D 3F 3G	3A 3C 3D 3F 3G	3A 3C 3D 1E 3F 3G	2A 1B 3C 2D 2F 2G	3A 1B 3C 3D 1E 3F 3G	3A 1B 3C 3D 3F 3G	3A 1B 3C 3D 1E 3F 2G	
6	2A 2C 2D 2E 2F 2G	2A 1B 3C 2D 2E 2F 2G	3A 1B 2C 3D 3E 2F 3G	3A 1B 3C 3D 2E 2F 3G	2A 1B 3C 2D 2E 3F 3G	3A 3C 3D 2E 3F 3G	3A 3C 3D 3E 3F 3G	3A 1B 3C 2D 2E 2F 2G	3A 1B 3C 3D 3E 3F 3G	3A 1B 3C 3D 2E 3F 3G	3A 1B 3C 3D 3E 3F 2G	
7	2A 2B 2C	2A 3B 3C	3A 3B 2C 1D 1E 1F 1G	3A 3B 3C 1D 1G	2A 3B 3C 1F 1G	3A 2B 3C 1D 1F 1G	3A 2B 3C 1D 1E 1F 1G	3A 3B 3C	3A 3B 3C 1D 1E 1F 1G	3A 3B 3C 1D 1F 1G	3A 3B 3C 1D 1E 1F	
8	2A 2B 2C 2D 2E 2F 2G	2A 3B 3C 2D 2E 2F 2G	3A 3B 2C 3D 1E 2F 3G	3A 3B 3C 3D 2E 2F 3G	2A 3B 3C 2D 2E 3F 3G	3A 2B 3C 3D 2E 3F 3G	3A 2B 3C 3D 3E 3F 3G	3A 3B 3C 2D 2E 2F 2G	3A 3B 3C 3D 3E 3F 3G	3A 3B 3C 3D 2E 3F 3G	3A 3B 3C 3D 3E 3F 2G	
9	2A 2B 2C 2D 2F 2G	2A 3B 3C 2D 2F 2G	3A 3B 2C 3D 1E 2F 3G	3A 3B 3C 3D 2F 3G	2A 3B 3C 2D 3F 3G	3A 2B 3C 3D 3F 3G	3A 2B 3C 3D 1E 3F 3G	3A 3B 3C 2D 2F 2G	3A 3B 3C 3D 1E 3F 3G	3A 3B 3C 3D 3F 3G	3A 3B 3C 3D 1E 3F 2G	
0	2A 2B 2C 2D 2E 2F	2A 3B 3C 2D 2E 2F	3A 3B 2C 3D 3E 2F 1G	3A 3B 3C 3D 2E 2F 1G	2A 3B 3C 2D 2E 3F 1G	3A 2B 3C 3D 2E 3F 1G	3A 2B 3C 3D 3E 3F 1G	3A 3B 3C 2D 2E 2F	3A 3B 3C 3D 3E 3F 1G	3A 3B 3C 3D 2E 3F 1G	3A 3B 3C 3D 3E 3F	
H												2B 2C 1D 3E 3F 2G